REMARKS

Claims 1 and 13-32 are pending. Claims 23-26 have been amended and claims 28-32 have been added.

Claims 18-20 and 27 have been withdrawn by the examiner as being drawn to a different invention. Claims 23-26 inadvertently were indicated to be copolymer claims when they should have been process claims dependent upon claim 18. Any inconvenience resulting from this error is regretted.

The support for claims 30-32 can be found, *inter alia*, on page 4, lines 16-19 and 21-22 in Table 1.

The restriction requirement between claims 1, 13-17 and 21-26 (Group I) and claims 18-20 and 27 (Group II) is again traversed.

The examiner states that the claims lack the same or corresponding special technical features because the copolymers are the same as those described by Meka et al. (WO 93/03093) and thus there is no contribution over the art.

Applicants have shown why the art used to reject the claims, Brant et al., and Holtcamp et al., do not anticipate or make obvious the claimed copolymers. Since these are presumably the closest prior art, it follows that the copolymers also make a contribution over the copolymers of Meka et al. The examiner is requested to withdraw the restriction requirement.

Claims 1, 13-17 and 21-26 stand rejected as being obvious over Brant et al. (WO 93/12151).

Brant teaches that C_2-C_{10}-copolymers having a Mw/Mn of 2-4, a density of 0.85-0.95 g/cm^3, a Mw of 30,000-1,000,000 daltons and a CDBI (composition distribution breadth index) of 70% or more may be made with certain metallcoene catalysts (page 5, lines 15-18, line 32, to page 6, line 1; page 12, line 37).

While this is the broad teaching of the reference, the working examples do not describe any copolymers:

(1) having any CDBI percentages or

(2) having Mn (number average molecular weight) of 150,000 g/mol.

The highest Mn molecular weight is the ethylene-1-decene copolymer of example 5 (Mw of 186,400/299,500) which translates to a Mn of about 119,800, i.e., Mn = 299,500/2.5. In view of the disparity between the broad teaching and the working examples, it is believed that this reference is nonenabling as to preparing the claimed copolymers having Mw/Mn of ≤ 10, density of 0.85 to 0.95 g/cm^3, comonomer content of 1 to 40% by weight, a molar mass Mn of above 150,000 g/mol and CDBI above 70%. There is just no teaching in the reference on how to raise the Mn to over 150,000 g/mol and maintain all the other claimed properties of the copolymer. Applicants copolymer molecular weights are significant since it is well known in this art that metallocene catalysts yield relatively low molecular weight copolymers as compared to conventional Ziegler-Natta catalysts, e.g., see Brant et al., page 3, lines 1-7 and 15-22; Soga et al., *Macromol. Chem. Phys.*, 195, 1369-1379, 1994, highlighted sections.

Note that catalysts of Soga et al. are heterogeneous metallocene catalysts, the

molecular weights are far below those of the claimed copolymers. This evidence is sufficient to rebut the allegation that the Brant et al. reference is enabling in preparing ethylene-C_3-C_{12}-copolymers having Mn molecular weights of above 150,000 g/mol and CDBIs above 70% in addition to the other claimed properties. The examiner has also not explained where Brant et al. teaches how to prepare copolymers having Mn molecular weights of above 150,000 g/mol and a CDBI of above 70%.

Additionally, there is no motivation in Brant et al. to prepare copolymers having the claimed molecular weights since he only exemplifies copolymers of a much lower molecular weight in the working example.

The reference is even further removed from the dependent claims.

Thus, claims such as 15 (propene, 1-butene, 1-hexene and 1-octene) and 17 (Mn above 200,000 g/mol) claims comonomers that are not even contemplated by Brant et al. with Mn molecular weights that are much higher than any copolymers actually exemplified by the reference. It is noted that the examiner did not explain how claim 15 was obvious over Brant et al. New claim 28 incorporates the limitations of claims 14, 15, 6 and 17 , and defines a subgroup of copolymers which Brant et al. do not even contemplate, much less teach how to prepare.

Claims 29 and 30 further limit claim 28 to hexene-1 and a CDBI of about 95%. Such copolymers defined by these specific properties are not contemplated or enabled by the disclosure of Brant et al.

Claims 31 and 32, which are directed to preferred species are clearly not obvious

over the teachings of Brant et al.

There is also no motivation in Brant et al. to prepare the comonomers of claims 14, 15, 17 and 28-32 since they are either outside the scope of the disclosure or are merely described in terms of "an invitation to experiment." Such is not in accordance with 35 USC § 103(a).

Claims 1, 13-17 and 21-26 stand rejected as being obvious over Holtcamp et al. (US 6,476,166 B1). Similarly to the Brant et al. reference, Holtcamp et al. actually exemplify a very narrow group of ethylene polymers while broadly having a disclosure that is also based on "an invitation to experiment." Thus, while the broad disclosure of molecular weight is recited in melt index as 0.01 dg/min. to 1000 dg/min. (HSTM-D-1238-E) (col. 11, lines 41-43), the only relevant teaching is in Example 1 (ethylene-hexene-1, Mn of 18600) and examples 22 and 23 (ethylene-hexene-1, Mn of 44,500 or 45,900 and CDBI of 68.1 and 42.2). The only other examples that describe the pertinent properties directed to homopolymers of examples 3 and 4, are ethylene. Like Brant et al. there is no motivation to form copolymers having the claimed properties. There is no teaching of how to prepare a copolymer that has a Mn molecular weight above 150,000/mol and a CDBI of over 70% while maintaining the other properties of claim 1. As an example, an extrapolation of the Mn from examples 1, 21 and 22 (based on percent hexene-1) indicates that under these polymerization conditions that a Mn of 150,000 g/mol could probably not be reached within the limitations of claim 1 (1% lower limit of comonomer). As for the molecular weight, there is no evidence of record

equating an ethylene-C_2-C_{12}-α-olefin copolymer having a Mn molecular weight of above 150,000 g/mol with melt indexes in the range of 0.01 to 100 g/min. The examiner is assuming that the disclosed melt index encompasses the claimed range. The 0.001 to 20 g/10 min. in the specification (page 4, line 20) is the high load melt index and not the same as in Holtcamp et al.

There is even less motivation and enablement in the reference for the embodiments in claims 14, 17 and 28-32. If these rejections are maintained the examiner is requested to point out in the references or otherwise how one of ordinary skill in the art would modify the working examples in order to prepare the claimed copolymers.

A favorable response is solicited.

A check in the amount of $110.00 is attached to cover the one month extension fee.

Please charge any shortage in fees due in connection with the filing of this paper, including Extension of Time fees to Deposit Account No. 11-0345. Please credit any excess fees to such deposit account.

Respectfully submitted,
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COMPLETE LISTING OF ALL CLAIMS IN THE APPLICATION

1. (original) A copolymer of ethylene with C_3-C_{12}-α-olefins, which has a polydispersity Mw/Mn of ≤ 10, a density of from 0.85 to 0.95 g/cm^3, a proportion of from 1 to 40% by weight of comonomer and a molar mass Mn above 150,000 g/mol and a comonomer composition distribution breadth index above 70%.

2-12. (canceled)

13. (previously presented) The copolymer as claimed in claim 1, wherein said density is from 0.88 to 0.93 g/cm^3.

14. (previously presented) The copolymer as claimed in claim 1, wherein said comonomer composition distribution breadth index is above 90%.

15. (previously presented) The copolymer as claimed in claim 1, wherein said α-olefins are selected from the group consisting of propene, 1-butene, 1-hexene and 1-octene.

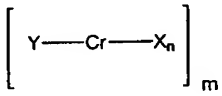
16. (previously presented) The copolymer as claimed in claim 1, wherein said polydispersity Mw/Mn is from 2 to 4.

17. (previously presented) The copolymer as claimed in claim 1, wherein said molecular weight Mn is above 200,000 g/mol.

18. (previously presented) A process for preparing ethylene copolymers as claimed in claim 1, which comprises carrying out the process in the presence of the following components:

(A) a substituted monoindenyl chromium complex or a substituted

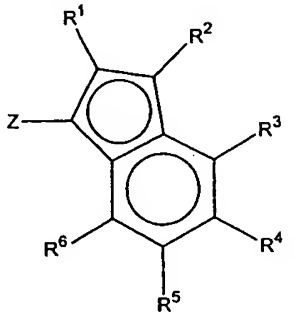
monofluorenylchromium complex of the formula I



I,

wherein

Y has the following formula II



II

wherein

Z is an unsubstituted, substituted or condensed heteroaromatic ring system,

X independently of one another, are fluorine, chlorine, bromine, iodine, hydrogen, C_1-C_{10}-alkyl, C_2-C_{10}-alkenyl, C_6-C_{20}-aryl, alkylaryl having from 1-10 carbon atoms in the alkyl radical and from 6-20 carbon atoms in the aryl radical, NR^7R^8, OR^7, SR^7, SO_3R^7, $OC(O)R^7$, CN, SCN, β-diketonate, CO, BF_4-, PF_6- or bulky noncoordinating anions,

R^1-R^8 independently of one another, are hydrogen, C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl radical and from 6-20 carbon atoms in the aryl radical,

SiR^9_3, wherein the organic radicals R^1-R^8 optionally have halogen substituted and any two geminal or vicinal radicals R^1-R^8 optionally have been bonded to give a 5- or 6-membered aromatic or aliphatic ring,

R^9 independently of one another, are hydrogen, C_1-C_{20}-alkyl, C_2-C_{20}-alkenyl, C_6-C_{20}-aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl radical and from 6-20 carbon atoms in the aryl radical, or wherein the two geminal radicals R^9 have been bonded to give a five- or six-membered ring,

n is 1, 2 or 3, and

m is 1, 2 or 3,

and

optionally (B) one or more activator compounds.

19. (previously presented) The process as claimed in claim 18, wherein Z is an unsubstituted or substituted 8-(quinolyl) system and R^1-R^6 are hydrogen.

20. (previously presented) The process as claimed in claim 18, wherein the activator compound (B) is used and is a compound selected from the group consisting of aluminoxane, dimethylanilinium tetrakispentafluorophenylborate, trityl tetrakispentafluorophenylborate and trispentafluorophenylborane.

21. (previously presented) A polymer mixture which comprises said at least one of the copolymer of ethylene with C_3-C_{12}-α-olefins as claimed in claim 1.

22. (previously presented) A fiber, a film or a molding which comprises the copolymer of ethylene with C_3-C_{12}-α-olefins as claimed in claim 1.

B1

23. (currently amended) The ~~copolymer as~~ process claimed in claim ~~13~~ 18, wherein said comonomer composition distribution breadth index is above 90%.

24. (currently amended) The ~~copolymer as~~ process claimed in claim ~~23~~ 18, wherein said α-olefins are selected from the group consisting of propene, 1-butene, 1-hexene and 1-octene.

25. (currently amended) The ~~copolymer as~~ process claimed in claim 24, wherein said polydispersity Mw/Mn is from 2 to 4.

26. (previously presented) The copolymer as claimed in claim 25, wherein said molecular weight Mn is above 200,000 g/mol.

27. (previously presented) The process as claimed in claim 19, wherein the activator compound (B) is used and is a compound selected from the group consisting of aluminoxane, dimethylanilinium tetrakispentafluorophenylborate, trityl tetrakispentafluorophenylborate and trispentafluorophenylborane.

28. (new) The copolymer of claim 13, wherein the comonomer composition distribution breadth index is above 90%, the α-olefins are selected from the group consisting of propene, 1-butene, 1-hexene and 1-octene, the polydispersity Mw/Mn is from 2 to 4 and the molecular weight Mn is above 200,000 g/mol.

29. (new) The copolymers of claim 28 wherein the comonomer is hexene-1.

30. (new) The copolymer of claim 29 wherein the CDBI is about 95%.

31. (new) The copolymer of claim 29 wherein the density is about 0.88, the CDBI is about 95% and the polydispersity Mw/Mn is about 3.

32. (new) The copolymer of claim 31 wherein the density is 0.884, the CDBI is 95%, the molecular weight Mn is about 224,000 and the polydispersity is 3.3.